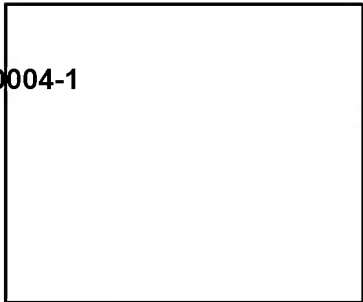


STAT
To:

Approved For Release

2002/10/16 : CIA-RDP71B00822R000100210004-1

ILLEGIB



8 June 1965

John,

Here is the information I promised you
from our phone conversation this afternoon.

Milt

mb

TABLE IV
FIGURES OF MERIT - COMPARISON TABLE

HIGH VALUES ARE
DESIRED

| | Density (ρ) | | Modulus Of Elasticity (E) | | E/D | (E/D) ^{1/2} | Thermal Conductivity (K) | | Specific Heat (C) | | Coefficient of Expansion (α) | | K/Ko | (K/D) |
|----------------------------|-----------------------|---------------------|---------------------------|------------------------|------------------------|----------------------|--------------------------|----------------|-------------------|-------------|---------------------------------------|-------------------------|------------------------|-------|
| | Grams/cm ³ | Lbs/in ³ | Newtons/cm ² | Lbs/in ² | | | Cal/cm-sec - °C | BTU/ft-hr - °F | Cal/gm - °C | BTU/lb - °F | °C ⁻¹ | °F ⁻¹ | | |
| Fused Quartz | 2.20 | .080 | 7.0 x 10 ⁶ | 10.1 x 10 ⁶ | 3.18 x 10 ⁶ | 1.00 | .0033 | .80 | .188 | .188 | .55 x 10 ⁻⁶ | 31 x 10 ⁻⁶ | 31.9 x 10 ³ | 1.00 |
| Pyrex (7740) | 2.35 | .085 | 6.8 x 10 ⁶ | 9.8 x 10 ⁶ | 2.89 x 10 ⁶ | .91 | .0027 | .60 | .25 | .25 | 3.2 x 10 ⁻⁶ | 1.8 x 10 ⁻⁶ | 3.38 x 10 ³ | 1.06 |
| Vycor (7900) | 2.18 | .079 | 6.7 x 10 ⁶ | 9.7 x 10 ⁶ | 3.07 x 10 ⁶ | .97 | .0022 | .53 | .19 | .19 | .80 x 10 ⁻⁶ | .44 x 10 ⁻⁶ | 14.5 x 10 ³ | 1.1 |
| Invar (36%Ni) | 8.0 | .292 | 14.6 x 10 ⁶ | 21.4 x 10 ⁶ | 1.85 x 10 ⁶ | .58 | .026 | 6.3 | .095 | .095 | 1.3 x 10 ⁻⁶ | .70 x 10 ⁻⁶ | 190 x 10 ³ | 1.25 |
| Titanium | 4.54 | .164 | 11.6 x 10 ⁶ | 16.8 x 10 ⁶ | 2.55 x 10 ⁶ | .80 | .042 | 10.1 | .126 | .126 | 8.5 x 10 ⁻⁶ | 4.7 x 10 ⁻⁶ | 39.1 x 10 ³ | 1.22 |
| Magnesium | 1.74 | .063 | 4.5 x 10 ⁶ | 6.5 x 10 ⁶ | 2.59 x 10 ⁶ | .81 | .38 | 92 | .25 | .25 | 26 x 10 ⁻⁶ | 14 x 10 ⁻⁶ | 58.5 x 10 ³ | 1.83 |
| Beryllium | 1.82 | .066 | 28 x 10 ⁶ | 40 x 10 ⁶ | 15.4 x 10 ⁶ | 4.84 | .38 | 92 | .516 | .516 | 12.4 x 10 ⁻⁶ | 6.9 x 10 ⁻⁶ | 59.5 x 10 ³ | 1.66 |
| Pyrocera (9608) | 2.50 | .090 | 8.7 x 10 ⁶ | 12.5 x 10 ⁶ | 3.48 x 10 ⁶ | 1.10 | .0047 | 1.14 | .19 | .19 | 40 x 10 ⁻⁶ | .22 x 10 ⁻⁶ | 62.0 x 10 ³ | 1.95 |
| "Pomoglass" | .143 | .0052 | 12 x 10 ⁶ | 18 x 10 ⁶ | 94 x 10 ⁶ | 26 | .00014 | .033 | .20 | .20 | 8.3 x 10 ⁻⁶ | 4.6 x 10 ⁻⁶ | .085 x 10 ³ | .0027 |
| Silica-Slip Cast | 1.9 | .069 | 7.0 x 10 ⁶ | 10.1 x 10 ⁶ | 3.68 x 10 ⁶ | 1.16 | .00078 | .188 | .22 | .22 | 54 x 10 ⁻⁶ | .30 x 10 ⁻⁶ | 6.5 x 10 ³ | .206 |
| Aluminum | 2.70 | .097 | 6.9 x 10 ⁶ | 10.0 x 10 ⁶ | 2.56 x 10 ⁶ | .80 | .53 | 128 | .215 | .215 | 23.9 x 10 ⁻⁶ | 13.3 x 10 ⁻⁶ | 100 x 10 ³ | 3.14 |
| Alloy LA-685 (Super Invar) | 8.17 | .296 | 13.8 x 10 ⁶ | 20 x 10 ⁶ | 1.70 x 10 ⁶ | .53 | .026 | 6.3 | .12 | .12 | 0.1 x 10 ⁻⁶ | .06 x 10 ⁻⁶ | 2164 x 10 ³ | 4.8 |

| | | | | | | | |
|----------|-----------------------------------|-------|-----|-----|---|---|---------------|
| I. | .07 | 25-30 | 357 | 429 | X | X | -100 +200° 7 |
| | | | | | | | 300 600 2.5 |
| II. | .07 | 7-10 | 100 | 143 | X | X | -100 +200° 7 |
| | | | | | | | 300 +200° 2.5 |
| Case I. | 70% boron - 30% Resin | | | | | | |
| Case II. | 20% boron - 50% Glass - 30% Resin | | | | | | |

| | | | | | | | | | | | | | | |
|-------------------------------|------|-------|--------------------|--------------------|--------------------|------|--------|------|------|------|-----------------------|-----------------------|--------------------|-------|
| Pyrex (77-0) | 2.35 | .085 | 6.8×10^5 | 9.8×10^6 | 2.89×10^6 | .91 | .0027 | .50 | .25 | .25 | 3.2×10^{-6} | 1.8×10^{-6} | 3.38×10^3 | 106 |
| Vycor (7900) | 2.18 | .079 | 6.7×10^5 | 9.7×10^6 | 3.07×10^6 | .97 | .0022 | .53 | .19 | .19 | $.80 \times 10^{-6}$ | $.44 \times 10^{-6}$ | 14.5×10^3 | .45 |
| Invar (3611) | 3.0 | .292 | 14.8×10^5 | 21.4×10^6 | 1.85×10^6 | .58 | .026 | 6.3 | .095 | .095 | 1.3×10^{-6} | $.70 \times 10^{-6}$ | 190×10^3 | 5.95 |
| Titanium | 4.54 | .164 | 11.5×10^6 | 16.8×10^6 | 2.55×10^6 | .80 | .042 | 10.1 | .126 | .126 | 8.5×10^{-6} | 4.7×10^{-6} | 39.1×10^3 | 1.22 |
| Magnesium | 1.74 | .063 | 4.5×10^6 | 6.5×10^6 | 2.59×10^6 | .81 | .38 | 92 | .25 | .25 | 26×10^{-6} | 14×10^{-6} | 58.5×10^3 | 1.83 |
| Beryllium | 1.82 | .066 | 28×10^6 | 40×10^6 | 15.4×10^6 | 4.84 | .38 | 92 | .516 | .516 | 12.4×10^{-6} | 6.9×10^{-6} | 59.5×10^3 | 1.66 |
| Pyroceram (9608) | 2.50 | .090 | 8.7×10^6 | 12.5×10^6 | 3.48×10^6 | 1.10 | .0047 | 1.14 | .19 | .19 | 40×10^{-6} | $.22 \times 10^{-6}$ | 62.0×10^3 | 1.95 |
| Foamglass | .143 | .0052 | $.12 \times 10^6$ | $.18 \times 10^6$ | $.84 \times 10^6$ | .26 | .00014 | .033 | .20 | .20 | 8.3×10^{-6} | 4.6×10^{-6} | $.085 \times 10^3$ | .0027 |
| Silica-Slop Cast | 1.9 | .069 | 7.0×10^6 | 10.1×10^6 | 3.68×10^6 | 1.16 | .00078 | .188 | .22 | .22 | $.54 \times 10^{-6}$ | $.30 \times 10^{-6}$ | 6.5×10^3 | .206 |
| Aluminum | 2.70 | .097 | 6.9×10^6 | 10.0×10^6 | 2.56×10^6 | .80 | .53 | 128 | .215 | .215 | 23.9×10^{-6} | 13.3×10^{-6} | 100×10^3 | 3.14 |
| Alloy LA-685 (Super Invar) | 8.11 | .296 | 13.8×10^6 | 20×10^6 | 1.70×10^6 | .53 | .026 | 6.3 | .12 | .12 | 0.1×10^{-6} | $.06 \times 10^{-6}$ | 2165×10^3 | 68.0 |